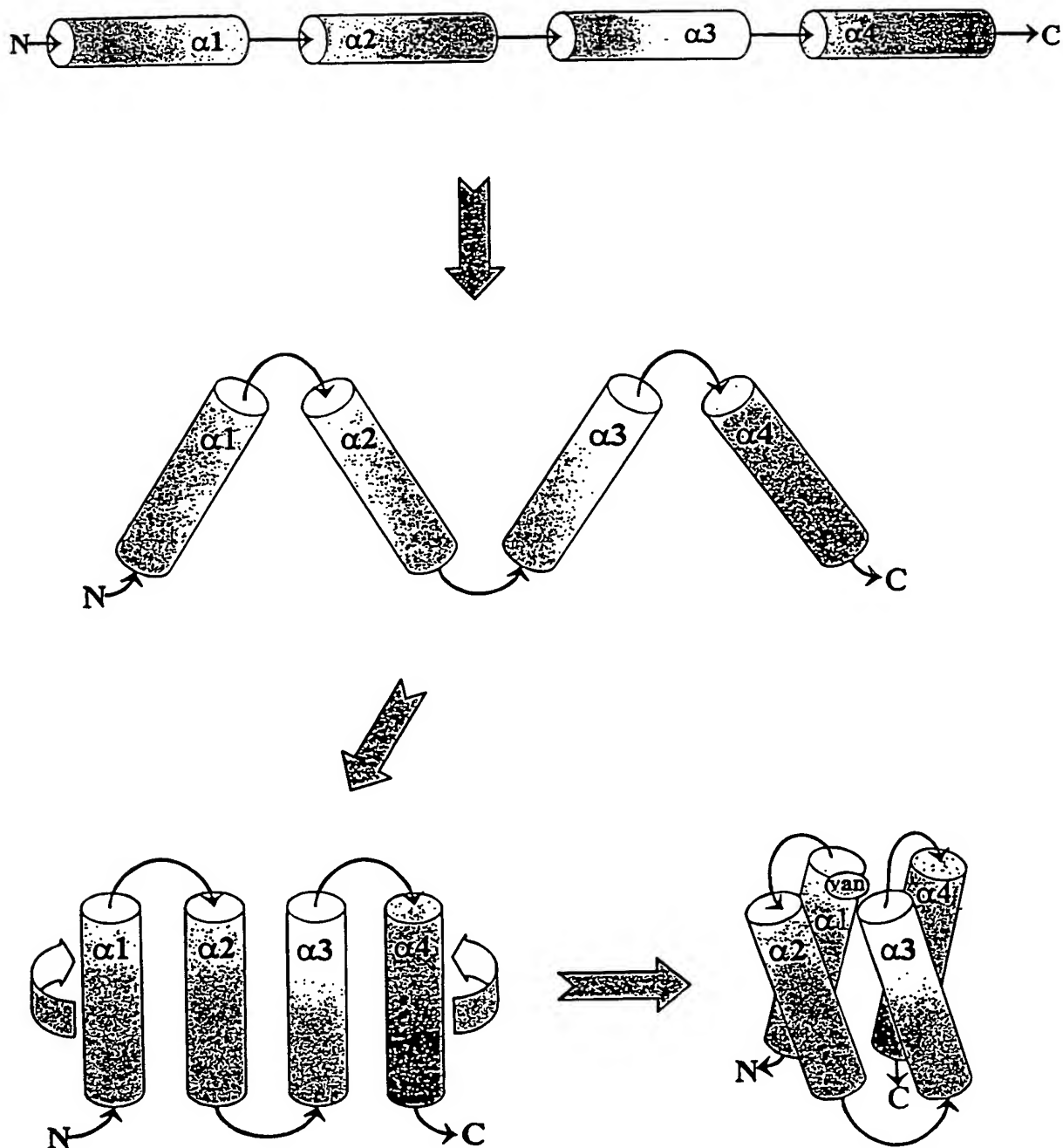


Figure 1



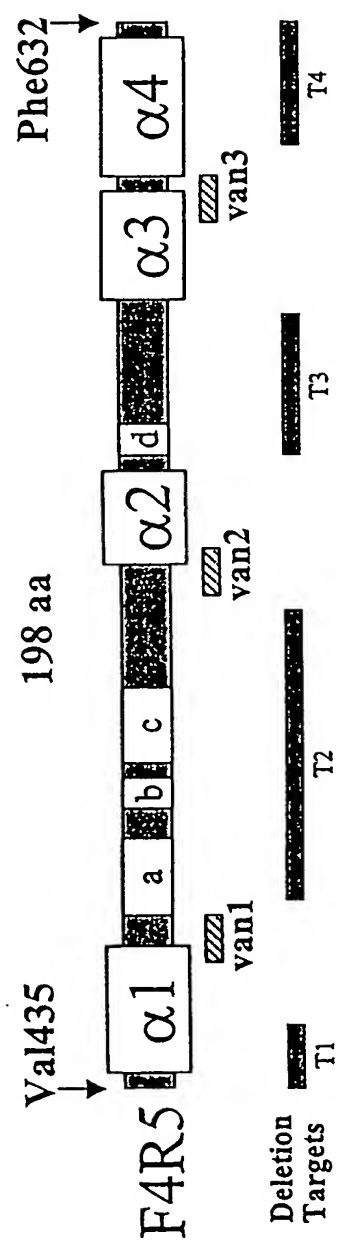
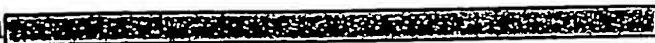

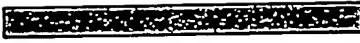
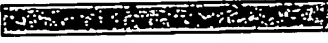

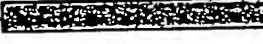

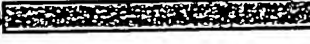



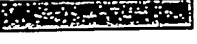


FIG. 2

**Figure 3**  
**Recombinant *Fucus* Vanadium Peroxidase Proteins**

		# of Amino acids	kDa	VPx activity
rVPx1	M1  A676	676	73.4	+
rVPx2	A137  A676	540	58.6	+
rVPx3	L313  A676	364	40.0	+
F1	E343  A676	334	36.8	+
F2	G373  A676	304	33.4	+
F3	Y404  A676	273	29.8	+
F4	V435  A676	242	26.5	+
R5	L313  F632	320	35.5	+
R6	L313  Q652	340	37.6	+
F1R6	E343  Q652	310	34.4	+
F2R6	G373  Q652	280	31.0	+
F4R5	V435  F632	198	21.7	+

Amino Acid Site in rVPx1 <i>Fucus</i> Enzyme	Potential Amino Acid Role in vanadate-binding motifs 1-3	Amino acid at Corresponding <i>Ascophyllum</i> Site
Lys460	Vanadium Binding - 1 <sup>st</sup>	Lys341
Arg468	Vanadium Binding - 1 <sup>st</sup>	Arg349
Ser535	Vanadium Binding- 2 <sup>nd</sup>	Ser416
Gly536	Vanadium Binding- 2 <sup>nd</sup>	Gly417
His537	Vanadium Binding- 2 <sup>nd</sup>	His418
Arg599	Vanadium Binding – 3 <sup>rd</sup>	Arg480
His605	Vanadium Binding – 3 <sup>rd</sup>	His486
His464	In BrPx Only - 1 <sup>st</sup>	His345
His530	In BrPx Only - 2 <sup>nd</sup>	His411
Ala455	Activity -1 <sup>st</sup>	Ser336
Cys457	Activity - 1 <sup>st</sup>	Trp338
Val525	Activity - 2 <sup>nd</sup>	Glu406

FIG. 4

1<sup>st</sup> Conserved Motif:

AQRASCYQKWQVHRFARPEALG	Fucus
AxxxxxYQKxxxHRxxRPEAxG	Algal
AxxxxxxxxKxxx (x) xxxRPxx (x) G	Algal and Fungal
Kxxx (x) xxxRP	Algal, Fungal, Phosphatases & Other Proteins

(x) = amino acid present in algal enzymes only

2<sup>nd</sup> Conserved Motif:

PTHPSYPSGHATQNGAFAT	Fucus
PxHPSYxSGHAXxxGA	Algal
PxxPxYxSGHAXxxGA	Algal and Fungal
(SY)PSGH	Algal, Fungal, Phosphatases & Other Proteins

(SY) = conserved in some of the proteins

3<sup>rd</sup> Conserved Motif:

NKLAVNVAFGROMLGIHYRFD	Fucus
NKLAXNXAXGRxMxGxHYxxD	Algal
AxxRxxxGxHxxxD	Algal and Fungal
Rxx (G) xHxxx (D)	Algal, Fungal, Phosphatases & Other Proteins